

REMARKS

This communication responds to the Office Action mailed on December 18, 2003, and the references cited therewith. Claims 1, 7, 12, 21, and 26 are amended, claims 2, 8, and 13 are canceled, and no claims are added. As a result, claims 1, 3-7, 9-12, and 14-49 are now pending in this Application.

Affirmation of Election

In accordance with the Restriction Requirement presented in the Office Action, the Applicant elects to prosecute claims 1-30 (i.e., Group I) without traverse. Claims 31-49 are hereby withdrawn.

The Applicant reserves the right to request allowance of the withdrawn claims when a generic claim is found to be allowable, as well as the right to re-introduce the withdrawn claims into this or any other application. Further, the Applicant hereby preserves the right to enter process claims that depend from or otherwise incorporate the limitations of allowed product claims prior to any Final Office Action or Allowance by immediately requesting the rejoinder of those process claims included in claims 31-49 which meet the provisions of M.P.E.P. § 821.04. Any amendments to claims 31-49 considered necessary by the Examiner to permit rejoinder will be considered by the Applicant in due course. At this time, no such amendment appears to be needed.

Examiner Interview Summary

Finally, it is noted that the Examiner contacted Mr. Edward J. Brooks, III on December 10, 2003 regarding the provisional election of claims 1-30. It is respectfully requested that any future communication with respect to this matter be conducted with a member of the law firm of Schwegman, Lundberg, Woessner & Kluth, P.A (e.g., Mark V. Muller at ph: 210-308-5677, and/or the undersigned). Mr. Brooks is no longer employed by this firm.

§102 Rejection of the Claims

Claims 1, 3-7, 9, 12, 14, 16-21, and 23-30 were rejected under 35 USC § 102(b) as being anticipated by Haulin (U.S. Patent No. 5,498,972, hereinafter "Haulin"). The Applicant does not

admit that Haulin is prior art and reserves the right to swear behind this reference at a later date. In addition, because the Applicant asserts that the Office has not shown that Haulin discloses the identical invention as claimed, the Applicant respectfully traverses this rejection of the claims.

Anticipation under 35 USC § 102 requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), *cert. denied*, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, “[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). “The *identical invention* must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP § 2131 (emphasis added).

First, with respect to independent claims 1, 7, and 12 (as amended), it is respectfully noted that Haulin does not disclose a “test domain is a first ground connection of the integrated circuit”, as admitted in the Office Action and claimed by the Applicant. See Paper #6, page 8. This is also the case for all claims depending from claims 1, 7, and 12.

Second, the assertion has been made, with respect to independent claims 16 and 20, that Haulin discloses “at least two integrated circuit packages, which may be a first memory integrated circuit package and a second memory integrated circuit package (11) connected to the conductive layer (15), having a memory bus, which is shown in detail in Figure 3.” The Applicant respectfully disagrees.

Haulin speaks to a circuit board 3 having one or more integrated circuit packages 11. The only instance in which the term “memory” is used by Haulin is for the off-board memory 8, which may be a hard disk. Therefore, Haulin does not disclose “a first memory integrated circuit package ... and a second memory integrated circuit package” as claimed by the Applicant in claims 16 and 20. This is also the case for all claims depending from claims 16 and 20, especially including claim 18, which adds the additional element of “an analog-to-digital converter” to the measurement circuit within the memory integrated circuit package.

While the assertion is made in the Office Action that “a peak detector (41) and a comparison circuit (45) ... is functionally equivalent to analog-to-digital converter (A/D),” the Applicant respectfully disagrees. A “comparator circuit accepts input of linear voltages and provides a digital output that indicates when one input is less than or greater than a second.” *Electronic Devices and Circuit Theory*, Robert Boylestad and Louis Nashelsky, pg. 609, Prentice-Hall, Inc., 1982. Analog-to-digital converters typically use dual-slope or ladder-network conversion principles to render a digital output, typically provided by a counter, representing the magnitude of the analog voltage input. *See Id.*, pgs. 616-620. In other words, “what most ADCs do is to find a fractional number, given by the binary output, that is the closest smaller fraction of the analog input voltage.” *Microprocessor-Based Control*, Curtis D. Johnson, pg. 90, Prentice-Hall, Inc., 1984. This result is impossible to accomplish with a simple comparator, as no fractional output is available. Thus, the peak detector and comparator of Haulin are not the same thing as the analog-to-digital converter claimed by the Applicant.

Haulin also never mentions the terms “bus” or “microprocessor”. Therefore, Haulin does not disclose the additional element of “a processor circuit card including a memory bus” as claimed by the Applicant in claim 20.

Third, it is respectfully noted that Haulin does not teach measuring a difference between a test voltage and a reference voltage “wherein the ... difference ... is acquired and stored by the data acquisition system” as claimed by the Applicant in claims 21 and 26 (as amended). Haulin describes a peak value detector 41 to sense a voltage value, and to pass a signal representing the value on to a comparator. It is the result of the comparison that is delivered to a boundary scan cell 36. *See Haulin*, Col. 5, lines 32-41. Thus, Haulin does not store the voltage value sensed by the detector 41, but rather, the result of a comparison with this value provided by the comparator 45. This is not identical to what is claimed by the Applicant.

Therefore, since Haulin does not teach these identified elements with respect to independent claims 1, 7, 12, 16, 20, 21, and 26, as well as the claims that depend from them, what is disclosed by Haulin is not identical to the subject matter of the embodiments claimed, and the rejection of claims 1, 3-7, 9, 12, 14, 16-21, and 23-30 under § 102 is improper.

If the Examiner is not firmly convinced of the major differences between what is claimed by the Applicant and what is taught by Haulin, the Applicant respectfully requests an interview with the Examiner. Reconsideration and allowance are respectfully requested.

§103 Rejection of the Claims

Claims 10, 11, and 15 were rejected under 35 USC § 103(a) as being unpatentable over Haulin. Claims 2, 8, 13, and 22 were rejected under 35 USC § 103(a) as being unpatentable over Haulin in view of Roy et al. (U.S. Patent No. 6,195,613, hereinafter "Roy"). The Applicant do not admit that Haulin or Roy are prior art, and reserve the right to swear behind these references at a later date. Further, since a *prima facie* case of nonobviousness has not been established in each case, as required by M.P.E.P. § 2142, the Applicant respectfully traverse these rejections.

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d (BNA) 1596, 1598 (Fed. Cir. 1988). In combining prior art references to construct a *prima facie* case, the Examiner must show some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art that would lead an individual to combine the relevant teaching of the references. *Id.* The M.P.E.P. contains explicit direction to the Examiner that agrees with the *In re Fine* court:

In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. M.P.E.P. § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d (BNA) 1438 (Fed. Cir. 1991)).

An invention can be obvious even though the suggestion to combine prior art teachings is not found in a specific reference. *In re Oetiker*, 977 F.2d 1443, 24 U.S.P.Q.2d (BNA) 1443 (Fed. Cir. 1992). However, while it is not necessary that the cited references or prior art specifically suggest making the combination, there must be some teaching somewhere which provides the suggestion or motivation to combine prior art teachings and applies that combination to solve the same or similar problem which the claimed invention addresses. One

of ordinary skill in the art will be presumed to know of any such teaching. (See, e.g., *In re Nilssen*, 851 F.2d 1401, 1403, 7 U.S.P.Q.2d 1500, 1502 (Fed. Cir. 1988) and *In re Wood*, 599 F.2d 1032, 1037, 202 U.S.P.Q. 171, 174 (C.C.P.A. 1979)). However, the level of skill is not that of the person who is an innovator but rather that of the person who follows the conventional wisdom in the art. *Standard Oil Co. v. American Cyanamid Co.*, 774 F.2d 448, 474, 227 U.S.P.Q. 293, 298 (Fed. Cir. 1985). The requirement of a suggestion or motivation to combine references in a *prima facie* case of obviousness is emphasized in the Federal Circuit opinion, *In re Sang Su Lee*, 277 F.3d 1338; 61 U.S.P.Q.2D 1430 (Fed. Cir. 2002), which notes that the motivation must be supported by evidence in the record.

No proper *prima facie* case of obviousness has been established because (1) combining the references does not teach all of the limitations set forth in the claims, (2) there is no motivation to combine the references, and (3) combining the references provides no reasonable expectation of success. The concerns expressed in the Office Action with respect to claims 2, 8, and 13 are now moot, since these claims have been canceled. However, each of these points will be explained in detail with respect to claims 10-11, 15, and 22, as follows.

The Combination of References Does Not Teach All Limitations: First, as noted previously, Haulin does not teach a “test domain is a first ground connection of the integrated circuit”, as admitted in the Office Action and claimed by the Applicant. This applies with respect to claims 10-11, 15, and 22. Neither does Roy.

Second, Haulin also does not teach measuring a difference between a test voltage and a reference voltage “wherein the ... difference ... is acquired and stored by the data acquisition system” as claimed by the Applicant in claim 21, and therefore in dependent claim 22. Neither does Roy.

Third, as admitted in the Office Action, Haulin also does not teach an “integrated circuit includes a memory array connected to the test domain” or an “integrated circuit includes an output driver connected to the test domain” as admitted in the Office Action and claimed by the Applicant in claims 10-11, and 15. Neither does Roy.

Finally, Haulin and Roy also fail to disclose several other elements claimed by the Applicant, namely:

- (1) a processor connected to the test domain (claims 9 and 14);

- (2) the measurement circuit includes an analog-to-digital converter (claims 18, 24, and 27);
- (3) the measurement circuit includes a digital-to-analog converter (claim 29); and
- (4) the plurality of differences are read from the data acquisition system by a computer terminal (since differences are not stored, per claim 29).

No Motivation to Combine References: It is asserted in the Office Action that “it would have been obvious ... to incorporate recording means such as a memory with driving circuit capability, for recording results of the testing operation, since on board memory provides high speed storage access.” The Applicant respectfully disagrees. In fact Haulin teaches away from this type of modification.

Haulin notes that the purpose of his invention is to use “a comparatively simple and cheap device” such that “the added complexity of the circuit is moderate.” Haulin, Col. 2, lines 1-6 and 37. This advantage does not accrue by adding additional memory to the measurement circuit, and in fact, is the reason that a hard disk 8 is used to record “the result of the testing operation.” Haulin, Col. 3, lines 47-50, since “an ordinary boundary scan cell 36 can be used as a means of reading the test result.” Haulin, Col. 8, lines 39-40. Thus, the Examiner appears to be using personal knowledge as the basis of this assertion, and is therefore respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2) to support the suggested changes to Haulin with respect to claims 10-11, and 15.

It is also asserted in the Office Action that “it would have been obvious ... to connect a pair of square conductive planes (110 and 120), corresponding to a first and second ground connection, respectively, as taught by Roy, across the measurement circuit (voltage monitor module) of Haulin, for the purpose of measuring the difference between two ground planes ...”. The Applicant respectfully disagrees. In fact, Haulin and Roy both teach away from this combination.

Haulin repeatedly emphasizes the importance of local monitoring and measurement of supply voltages after a circuit is mounted to a circuit board. See Haulin, Col. 2, lines 5-7, and Col. 5, lines 6-8. In fact, the supply voltage fluctuation problems associated with adding “an extra enhancing capacitor 23” are specifically noted. See Haulin, Col. 4, line 66 – Col. 5, line 5.

Adding the planes of Roy to the circuitry of Haulin would exacerbate the very problems Haulin desires to avoid.

Further, Roy notes that the conductive planes 110 and 120 are “10 in. x 10 in. square”, which are much too large to incorporate into an integrated circuit. Roy notes that multiple electrical resonances accrue with the use of such planes, as well as substantial radiated EMI. See Roy, Col. 3, lines 1-17. These problems would operate to disrupt the quiet measurement environment desired by the Applicant, observing that “the reference domain may be selected as a relatively “quiet” ground connection within the integrated circuit ...”. Application, pg. 12, lines 17-19. Thus, in this case also, the Examiner appears to be using personal knowledge, and is therefore respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2) to support the suggested changes to Haulin with respect to claim 22.

It should be noted that references must be considered in their entirety, including parts that teach away from the claims. See MPEP § 2141.02. The fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01.

No Reasonable Expectation of Success: As noted previously, modifying the apparatus of Haulin as suggested in the Office Action (respecting claims 10-11 and 15) does not lead to a reasonable expectation of success. Such modifications would in fact serve to increase the cost and complexity of Haulin.

Further, modifying Haulin to include the plates of Roy also provides no reasonable expectation of success. As noted above, in addition to being physically impossible, the resulting disruptive electrical measurement environment resulting is specifically addressed by Haulin and Roy, and rejected by each of them.

Therefore, since there is no evidence in the record to support disclosure by Haulin or Roy of a circuit wherein the “test domain is a first ground connection of the integrated circuit”, nor measuring a difference between a test voltage and a reference voltage “wherein the ... difference ... is acquired and stored by the data acquisition system”, nor an “integrated circuit includes a memory array connected to the test domain” or an “integrated circuit includes an output driver connected to the test domain”, as claimed by the Applicant, since there is no motivation to

combine the references to supply the missing elements, and since no reasonable expectation of success arises from the suggested modifications, a *prima facie* case of obviousness has not been established with respect to independent claims 7, 12, and 21. This conclusion applies with even greater force respecting dependent claims 10-11, 15, and 22, since any claim depending from a nonobvious independent claim is also nonobvious. See M.P.E.P. § 2143.03. It is therefore respectfully requested that the rejections of claims 10-11, 15, and 22 under 35 U.S.C. § 103 be reconsidered and withdrawn.

CONCLUSION

The Applicant respectfully submits that the claims, as amended, are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone the Applicant's attorney, Mark Muller, at (210) 308-5677, or the undersigned, to facilitate prosecution of this Application, or the undersigned. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 18 day of March, 2004.

Tina Kohut
Name


Signature